

Application No. 10/033,399
Amendment after Notice of Allowance

Amendments to the Claims:

Please amend claims 1, 75 and 77 as follows. This listing of claims replaces all prior versions of claims in the instant application.

1. (Currently amended) An adapter-directed display system for displaying an exogenous polypeptide on the outer surface of a phage particle, comprising:

(a) an expression vector comprising a coding sequence that encodes the exogenous polypeptide fused in-frame to a first adapter sequence, wherein the vector is devoid of outer-surface sequences encoding functional outer-surface proteins of the phage particle;

(b) a helper vector comprising outer-surface sequences encoding outer-surface proteins necessary for packaging the phage particle, wherein at least one of the outer-surface proteins is fused in-frame to a second adapter,

said first and second adapters acting, when the polypeptide is produced in a suitable host cell, to cause the display of the polypeptide via pairwise interaction between the first and second adapters.

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Allowed) The adapter-directed display system of claim 1, wherein the phage particle is a filamentous phage.

7. (Allowed) The adapter-directed display system of claim 1, wherein the outer-surface sequences are selected from the group consisting of gene III, gene VI, gene VII, gene VIII, and gene IX of a filamentous phage.

8. (Cancelled)

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9. (Cancelled)

10. (Allowed) The adapter-directed display system of claim 1, wherein the first and second adapters are homodimerization sequences.

11. (Allowed) The adapter-directed display system of claim 1, wherein the homodimerization sequences consist of a pair of cysteine residues.

12. (Allowed) The adapter-directed display system of claim 1, wherein the first and second adapters are heterodimerization sequences.

13. (Allowed) The adapter-directed display system of claim 1, wherein the first and second adapters form a coiled-coil dimer.

14. (Allowed) The adapter-directed display system of claim 13, wherein the first and second adapters are leucine zippers.

15. (Allowed) The adapter-directed display system of claim 13, wherein the first and second adapters comprise heterodimeric receptor sequences that mediate heterodimerization of the receptors.

16. (Allowed) The adapter-directed display system of claim 13, wherein the first and second adapters comprise heterodimerization sequences of GABA_B receptor 1 and GABA_B receptor 2, respectively.

17. (Allowed) The adapter-directed display system of claim 13, wherein the first and second adapters comprise heterodimerization sequences of GABA_B receptor 2 and GABA_B receptor 1, respectively.

18. (Allowed) The adapter-directed display system of claim 1, wherein the helper vector further comprises at least one additional copy of outer-surface sequence that competes for packaging with the at least one fusion outer-surface sequence in (b).

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19. (Allowed) The adapter-directed display system of claim 1, wherein the expression vector is selected from the group consisting of pABMX14 shown in Figure 9A, and pABMX15 shown in Figure 15A.

20. (Allowed) The adapter-directed display system of claim 1, wherein the phage helper vector is selected from the group consisting of GM-UltraHelper phage vector shown in Figure 5A, CM-UltraHelper phage vector shown in Figure 13A, and GMCT-UltraHelper phage vector shown in Figure 19A.

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

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35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Cancelled)

39. (Cancelled)

40. (Cancelled)

41. (Allowed) An expression vector for producing an exogenous polypeptide on the outer surface of a phage particle, comprising: a coding sequence encoding the exogenous polypeptide fused in-frame to a first adapter, wherein the vector is devoid of outer-surface sequences encoding functional outer-surface proteins of the phage particle, and expression of the exogenous polypeptide on the outer surface of the phage particle is mediated via non-covalent pairwise interaction between the first adapter and a second adapter, wherein the second adapter is fused to an outer-surface protein.

42. (Allowed) The expression vector of claim 41, wherein the vector is a phagemid vector.

43. (Cancelled)

44. (Cancelled)

45. (Cancelled)

46. (Cancelled)

47. (Allowed) The expression vector of claim 41, wherein the first and second adapters are homodimerization sequences.

48. (Allowed) The expression vector of claim 41, wherein the first and second adapters are heterodimerization sequences.

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49. (Allowed) The expression vector of claim 41, wherein the first and second adapters form a coiled-coil dimer.

50. (Allowed) The expression vector of claim 49, wherein the first and second adapters are leucine zippers.

51. (Allowed) The expression vector of claim 41, wherein the first and second adapters comprise heterodimeric receptor sequences that mediate heterodimerization of the receptors.

52. (Allowed) The expression vector of claim 51, wherein the first and second adapters comprise heterodimerization sequences of GABA_B receptor 1 and GABA_B receptor 2, respectively.

53. (Allowed) The expression vector of claim 51, wherein the first and second adapters comprise heterodimerization sequences of GABA_B receptor 2 and GABA_B receptor 1, respectively.

54. (Allowed) A kit comprising the adapter-directed display system of claim 1 in suitable packaging.

55. (Cancelled)

56. (Allowed) A kit comprising the expression vector of claim 41 in suitable packaging.

57. (Allowed) A host cell comprising the adapter-directed display system of claim 1.

58. (Cancelled)

59. (Allowed) A host cell comprising the expression vector of claim 41.

60. (Allowed) A method for displaying a polypeptide on the outer surface of a phage particle comprising causing the adapter-directed display system of claim 1 to be transcribed and translated in a single host cell.

61. (Allowed) A polypeptide displayed on the outer surface of a phage particle according to the method of claim 60, wherein the polypeptide is attached to the phage particle.

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62. (Allowed) A phage particle displaying on its outer surface a fusion polypeptide, said fusion polypeptide comprising an exogenous polypeptide sequence that is displayed, fused in-frame with a first adapter, said first adapter acting, when the fusion polypeptide is produced in a suitable host cell, to cause the display of the fusion polypeptide via non-covalent pairwise interaction between the first adapter and a second adapter that is linked to an outer-surface protein.

63. (Cancelled)

64. (Allowed) A selectable library comprising a plurality of phage particles, at least one being the phage particle of claim 62.

65. (Allowed) A selectable library comprising a plurality of phage particles, at least one member of the plurality displaying a polypeptide on its outer surface according to the method of claim 60.

66. (Allowed) A method of detecting the presence of a specific interaction between a test agent and an exogenous polypeptide that is displayed on a phage particle, the method comprising:

(a) providing a phage particle displaying the exogenous polypeptide that is prepared according to the method of claim 60;

(b) contacting the phage particle with the test agent under conditions suitable to produce a stable polypeptide-agent complex; and

(c) detecting the formation of the stable polypeptide-agent complex on the phage particle, thereby detecting the presence of a specific interaction.

67. (Allowed) The method of claim 66, wherein the exogenous polypeptide is selected from the group consisting of antigen-binding unit, cell surface receptor, receptor ligand, cytosolic protein, secreted protein, and nuclear protein.

68. (Allowed) The method of claim 66, wherein the exogenous polypeptide is an antigen-binding unit.

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69. (Allowed) The method of claim 66, wherein the test agent is selected from the group consisting of protein, polysaccharide, lipid, and combinations thereof.

70. (Allowed) The method of claim 66, wherein the test agent is an antigen.

71. (Allowed) The method of claim 66, wherein the test agent is a ligand.

72. (Allowed) A method of obtaining a polypeptide with desired property, comprising:

(a) providing a selectable library of claim 65; and

(b) screening the selectable library to obtain at least one phage particle displaying a polypeptide with the desired property.

73. (Allowed) The method of claim 72, wherein the desired property is binding specificity to an agent of interest.

74. (Allowed) The method of claim 72, wherein the screening the selectable library further comprises isolating the phage particle that displays a polypeptide having the desired property.

75. (Currently amended) The method of claim ~~72~~74, wherein isolating the phage particle further comprises obtaining a nucleotide sequence from the phage particle that encodes the polypeptide with the desired property.

76. (Allowed) The method of claim 72, wherein the polypeptide with the desired property is selected from the group consisting of antigen-binding unit, cell surface receptor, receptor ligand, cytosolic protein, secreted protein, nuclear protein, and functional motif of any one of the members of the group.

77. (Currently amended) The adapter-directed display system of claim 1, wherein the a helper vector comprising outer-surface sequences encoding all outer-surface proteins necessary for packaging the phage particle, wherein at least one of the outer-surface proteins is fused in-frame to a second adapter.